PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

United States Patent and Trademark Office
(Box PCT)
Crystal Plaza 2
Washington, DC 20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 02 June 1999 (02.06.99)	
International application No. PCT/FI98/00696	**Applicant's or agent's file reference** POLE-P
International filing date (day/month/year) 08 September 1998 (08.09.98)	**Priority date** (day/month/year) 08 September 1997 (08.09.97)
Applicant JERNSTRÖM, Rolf	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

07 April 1999 (07.04.99)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer Jean-Marie McAdams
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

WO 99/13187
PCT/FI98/00696

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:
LAITINEN, Pauli, S.
Patentti-Laitinen Oy
P.O. Box 29
FIN-02771 Espoo
FINLANDE

Date of mailing (day/month/year) 18 March 1999 (18.03.99)	
Applicant's or agent's file reference POLE-P	**IMPORTANT NOTICE**

International application No.	**International filing date** (day/month/year)	**Priority date** (day/month/year)
PCT/FI98/00696	08 September 1998 (08.09.98)	08 September 1997 (08.09.97)

Applicant
JEROL OY AB et al

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
   AU,BR,CN,EP,IL,JP,KP,KR,US

   In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:
   AL,AM,AP,AT,AZ,BA,BB,BG,BY,CA,CH,CU,CZ,DE,DK,EA,EE,ES,FI,GB,GE,GH,GM,HR,HU,ID,IS,
   KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MD,MG,MK,MN,MW,MX,NO,NZ,OA,PL,PT,RO,RU,SD,SE,SG,SI,
   SK,SL,TJ,TM,TR,TT,UA,UG,UZ,VN,YU,ZW
   The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on
   18 March 1999 (18.03.99) under No. WO 99/13187

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, **a demand for international preliminary examination** must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the **national phase**, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer
J. Zahra

Telephone No. (41-22) 338.83.38

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No. PCT/FI98/00596

International Filing Date 08 SEP 1998 (08.09.98)

The Finnish Patent Office
PCT International Application
Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference *(if desired) (12 characters maximum)* POLE-P

Box No. I TITLE OF INVENTION

A pole

Box No. II APPLICANT

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

Jerol Oy Ab
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FINLAND

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State *(that is, country)* of nationality: FI

State *(that is, country)* of residence: FI

This person is applicant for the purposes of: ☐ all designated States ☒ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

JERNSTRÖM, Rolf
Skutvägen 1
FIN-10600 Ekenäs
FINLAND

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: FI

State *(that is, country)* of residence: FI

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

LAITINEN, Pauli S

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☐ **Address for correspondence:** Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) *(mark the applicable check-boxes; at least one must be marked)*:

Regional Patent

- ☑ AP **ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☑ EA **Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☑ EP **European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☑ OA **OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT *(if other kind of protection or treatment desired, specify on dotted line)* .....

National Patent *(if other kind of protection or treatment desired, specify on dotted line)*:

- ☑ AL Albania .....
- ☑ AM Armenia .....
- ☑ AT Austria .and..Utility..Model....
- ☑ AU Australia .....
- ☑ AZ Azerbaijan
- ☑ BA Bosnia and Herzegovina .....
- ☑ BB Barbados
- ☑ BG Bulgaria .....
- ☑ BR Brazil .....
- ☑ BY Belarus .....
- ☑ CA Canada
- ☑ CH and LI Switzerland and Liechtenstein
- ☑ CN China .....
- ☑ CU Cuba .....
- ☑ CZ Czech Republic .and..Utility..Model
- ☑ DE Germany .and..Utility..Model...
- ☑ DK Denmark .and..Utility..Model...
- ☑ EE Estonia .and..Utility..Model...
- ☑ ES Spain .....
- ☑ FI Finland .and..Utility..Model....
- ☑ GB United Kingdom
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- ☑ GH Ghana .....
- ☑ GM Gambia
- ☑ ~~GW Guinea-Bissau~~ ..... ΔΔ
- ☑ HR Croatia
- ☑ HU Hungary .....
- ☑ ID Indonesia
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- ☑ IS Iceland
- ☑ JP Japan .....
- ☑ KE Kenya .....
- ☑ KG Kyrgyzstan .....
- ☑ KP Democratic People's Republic of Korea .....
- ☑ KR Republic of Korea .....
- ☑ KZ Kazakhstan .....
- ☑ LC Saint Lucia
- ☑ LK Sri Lanka
- ☑ LR Liberia
- ☑ LS Lesotho .....
- ☑ LT Lithuania
- ☑ LU Luxembourg
- ☑ LV Latvia
- ☑ MD Republic of Moldova .....
- ☑ MG Madagascar .....
- ☑ MK The former Yugoslav Republic of Macedonia .....
- ☑ MN Mongolia
- ☑ MW Malawi .....
- ☑ MX Mexico .....
- ☑ NO Norway
- ☑ NZ New Zealand .....
- ☑ PL Poland .....
- ☑ PT Portugal .....
- ☑ RO Romania
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- ☑ SD Sudan
- ☑ SE Sweden
- ☑ SG Singapore
- ☑ SI Slovenia .....
- ☑ SK Slovakia .and..Utility..Model.....
- ☑ SL Sierra Leone
- ☑ TJ Tajikistan .....
- ☑ TM Turkmenistan .....
- ☑ TR Turkey .....
- ☑ TT Trinidad and Tobago .....
- ☑ UA Ukraine .....
- ☑ UG Uganda .....
- ☑ US United States of America .....
- ☑ UZ Uzbekistan .....
- ☑ VN Viet Nam .....
- ☑ YU Yugoslavia .....
- ☑ ZW Zimbabwe .....

Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

- ☐ .....
- ☐ .....

ΔΔ DELETED BY RO/FI

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. *(Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)*

Box No. VI PRIORITY CLAIM ☐ Further priority claims are indicated in the Supplemental Box.

Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is: national application: country	regional application:* regional Office	international application: receiving Office
item (1) 08 Sept 1997 (08/09/1997)	973627	FINLAND		
item (2) 19 Dec 1997 (19/12/1997)	974586	FINLAND		
item (3)				

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) *(only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office)* identified above as item(s): (1), (2)

* *Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.*

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) *(if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used)*: ISA / SE

Request to use results of earlier search; reference to that search *(if an earlier search has been carried out by or requested from the International Searching Authority)*: Date *(day/month/year)* Number Country *(or regional Office)*

Box No. VIII CHECK LIST; LANGUAGE OF FILING

This international application contains the following **number of sheets**:

request	:	3
description (excluding sequence listing part)	:	4
claims	:	1
abstract	:	1
drawings	:	1
sequence listing part of description	:	
Total number of sheets	:	10

This international application is **accompanied** by the item(s) marked below:

1. ☒ fee calculation sheet
2. ☒ separate signed power of attorney
3. ☐ copy of general power of attorney; reference number, if any:
4. ☐ statement explaining lack of signature
5. ☐ priority document(s) identified in Box No. VI as item(s):
6. ☐ translation of international application into (language):
7. ☐ separate indications concerning deposited microorganism or other biological material
8. ☐ nucleotide and/or amino acid sequence listing in computer readable form
9. ☒ other *(specify)*: copy of Official action

Figure of the drawings which should accompany the abstract:

Language of filing of the international application: Finnish

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

PATENTTI-LAITINEN OY

Paul S Laitinen

RO/FI

For receiving Office use only

1. Date of actual receipt of the purported international application: 08 SEP 1998 (08.09.98)
2. Drawings: ☐ received: ☐ not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:
4. Date of timely receipt of the required corrections under PCT Article 11(2):
5. International Searching Authority (if two or more are competent): ISA / SE
6. ☒ Transmittal of search copy delayed until search fee is paid.

For International Bureau use only

Date of receipt of the record copy by the International Bureau: 05 OCTOBRE 1998 (05.10.98)

Pylväs

Tämä keksintö koskee pylvästä ja erityisesti, muttei yksinomaan pylvästä, jota voidaan käyttää esimerkiksi liikennemerkeissä, katuvaloissa, liikennevaloissa ja erilaisissa opastinpylväissä.

Pylväitä edellisiin tarkoituksiin valmistetaan monista materiaaleista. Pylväät ovat monista syistä, kuten esimerkiksi materiaalin säästämiseksi yleensä onttoja. Yleisimmin käytettyjä lienevät erilaiset metallipylväät. Muita vaihtoehtoja ovat lujite- tai muista muoveista valmistetut pylväät. Puupylväät ovat myös yleisessä käytössä.

Jotta pylväitä voidaan käyttää tarkoituksissa, joissa niiden kannattamana on erilaisia sähköisesti toimivia laitteita, kuten liikennevalot tai yleensä valolaite tai muita välineitä, joille tulee johtaa informaatiota tai vain virtaa pylväässä oleville laitteille, niihin täytyy lisätä sopivat johtimet signaalin tai virran viemiseksi. Tavanomaisesti tämä tapahtuu siten, että alhaalta tuodaan sopivat johtimet pylvään sisälle, ja pylväässä olevan luukun kautta johtimet yhdistetään pylvään sisällä oleviin johtimiin. Tarkoitusta varten tarvittava luukku on yleensä suurehko ja haittaa merkittävästi pylvään kestävyyttä.

Tämän keksinnön tarkoituksena on aikaansaada pylväs, jossa osasta tai kaikista edellä mainituista haitoista on päästy eroon ja aikaansaatu esivalmisteltu, hyvin käyttökelpoinen pylvästyyppi käytettäväksi hyvin moninaisissa tarkoituksissa.

Edellä mainitut ja muut tämän keksinnön edut ja hyvät puolet on aikaansaatu siten kuin esitetään tunnusomaiseksi oheisissa patenttivaatimuksissa.

Keksintöä kuvataan seuraavassa tarkemmin viittaamalla oheisiin piirustuksiin, joissa kuvataan eräitä keksinnön parhaimpana pidettyjen suoritusmuotojen käytännön sovellutuksia.

Niinpä kuvio 1 esittää poikkileikkausta eräästä keksinnön mukaisen pylvään

suoritusmuodosta; ja

Kuvio 2 esittää yhtä mahdollista järjestelyä kytkennän järjestämiseksi keksinnön mukaisen pylvään ja ulkoisten välineitten välille.

Kuviossa 1 esitetään siis havainnollisesti mittakaavoista välittämättä erään keksinnön mukaisen pylvään 1 poikkileikkaus. Pylväs on erityisesti ontto ja sisältää siis pitkittäisen ontelon 2. Pylvään perusrakenne on kaksikerrosrakenne, jossa on sisempi kerros 3 ja ulompi kerros 4. Näiden kerroksien 3 ja 4 seinämäpaksuudet voivat olla täysin jotakin muuta kuin kuviossa esitetään. Luultavimmin seinämäpaksuudet ovat selvästi esitettyä pienempiä.

Tässä hakemuksessa keksintöä kuvataan viittaamalla kaksikerrosrakenteeseen, mutta kaksi kerrosta ei suinkaan ole mikään pakollinen rakennetyyppi. Tilanne on täysin identtinen, jos kerroksia on vain yksi tai niitä lisätään ja niitä on kolme tai useampia.

Kuvioon 1 on liioitellusti suurentaen merkitty viisi eri paikkaa, joihin keksinnön perusajatus eli esiasennettu johdin tai johdinkimppu 5 voidaan keksinnön mukaisesti sijoittaa. On hyvin luultavaa, että edellä kuvatuista johtimien sijoituspaikoista käytetään yleisimmin vain yhtä tai kahta esimerkiksi siten, että yksi johdinkimppu sijaitsee pylvään yhdellä sivulla ja toinen toisella sivulla, jolloin johtimet 5 voivat sijaita samassa asemassa pylvään kerroksiin 3 ja 4 nähden tai myös eri asemassa.

Siis, johdin voidaan sijoittaa putkimaisen pylvään sisäpinnalle, sisempään kerrokseen 3, kerroksien 3 ja 4 rajapinnan tienoille, itse ulkokerrokseen 4 tai ulkokerroksen 4 pinnalle. Jos kysymyksessä on yksikerrosrakenne, sijoituspaikkoja on luonnollisesti vain kolme, pinnoilla tai kerroksen sisällä. Sijoituspaikka riippuu hyvin paljon pylvään valmistusmateriaaleista. On selvää, että käytettäessä metallista pylväsputkea ei ole teknisesti mahdollista tai ainakaan järkevää sijoittaa johtimia tällaiseen kerrokseen. Kuitenkin käytettäessä muovimateriaaleja on johtimien sijoittaminen kerroksen sisään helppoa.

Toisaalta on monia tilanteita, joissa johtimien sijoitus poikkileikkauksen samaan kohtaan koko matkalle ei ole tarkoituksenmukaista. Niinpä sellaisissa tilanteissa johtimet voivat siirtyä yhdestä paikasta toiseen, esimerkiksi johtimet voivat sijaita pylvään yläosassa kahden kerroksen välissä ja siirtyä pylvään alaosassa sisäkerroksen sisäpinnalle. Tilanteesta riippuen siirtyminen voi tapahtua sisäänpäin tai ulospäin tai tarvittaessa jopa vaihdella. Myös vaihtoehto, jossa johtimet muodostavat spiraalimaisen tai muuten ei-suoraviivaisen rakenteen pylvään ympärille, on mahdollinen.

Huomattakoon jo tässä vaiheessa, että kerros on tässä keksinnössä hyvinkin häilyvä käsite ja esimerkiksi tilanne, jossa johdin on valmiiksi kiinnitetty esimerkiksi teippimäisellä kerroksella pylvään ulkopinnalle, kuuluu keksinnön suojapiiriin. Tarkoituksena edellisellä maininnalla on sulkea suojapiiriin myös hyvin ohuet kerrokset.

Käytännössä pylvään rakenne voi, kuten edellä mainittiin, vaihdella hyvinkin paljon. Esimerkinomainen rakenne voisi olla sellainen, jossa sopivan sisäkerroksen 3 päälle asetetaan sopivalla laminointimenetelmällä vahvistettu kertamuovikerros siten, että kerroksien rajapinnalle jää johdinnippu, jota ulompi kerros sopivasti suojaa. Sisempi kerros voi olla lähes mitä tahansa materiaalia, esimerkiksi solumuovia, koska tarkoituksena on toimia etupäässä alustana ulkokerrokselle sitä tehtäessä. Sisempi kerros voi luonnollisesti olla myös vaikkapa metalliputki. Kerroksien vahvistamiseksi niihin voidaan lisätä mitä tahansa alalla tunnettua vahvikeainetta, kuten lasikuituja tai muita kuituja, kankaita, verkkoja tai vastaavia. Kuten edellä mainittiin, kerroksia voi olla useita, jolloin niiden valmistusmateriaalit ja valmistustavat valitaan kulloinkin vallitsevien tarpeiden mukaan.

Kuvio 2 esittää kaaviomaisesti, kuinka keksinnön mukainen pylväs on mahdollista esivalmistella niin, että pylvään 1 alaosaan asetetaan liitin 6, johon johtimet 5 on yhdistetty. Toisaalta liittimiä voi olla useitakin liittyen eri johdinnippuihin, jolloin kulloinkin tarpeita vastaava liitin ohjataan liittimeen sopivaan, jalustassa 8, joka voi olla mitä tahansa tyyppiä ja muotoa, olevaan liittimeen 7, johon on tuotu ulkopuolelta johtimet 9. Jos liittimiä 6 on pylvään sisällä useita, sopiva liitin ohjataan liittimeen 7 kääntämällä pylvästä niin, että yhteen tarkoitetut liittimet ovat

kohdakkain ja painamalla sen jälkeen pylväs jalustaan. Liittimien saattamiseen kunnolliseen kosketukseen toistensa kanssa voi liittyä myös esimerkiksi kiertoliike. Liittimet sinänsä voivat olla mitä tahansa tunnettua tyyppiä. Johtimet on kuviossa 2 esitetty tuoduksi pylvään sisätilaan pylvään seinämässä olevan reiän 10 kautta esimerkiksi kerroksien 3 ja 4 välisestä tilasta.

Sen sijaan, että pylvääseen asennetaan suoraan johtimia signaalin tai vastaavan viemiseksi paikasta toiseen, keksinnön perusperiaatteeseen kuuluu myös se vaihtoehto, että johtimien sijasta pylvääseen sijoitetaan väline tai välineitä, joiden avulla johdin voidaan helposti ja nopeasti viedä paikalleen. Käytännössä tällainen vientiväline on useimmiten putki, jonka sisälle johtimet voidaan työntää. Vaikka itse asiassa poikkileikkaukseltaan pyöreä useimmiten muovinen putki on varmaankin halvin ja sopivin vaihtoehto, on selvää, että putken tai vastaavan muodolla ei ole asialle mitään merkitystä. Tärkeää kuitenkin on, että väline muodostaa tulevia johtimia varten sopivan, helposti käytettävän kanavan.

Edellä kuvatulla tavalla vältetään luukkujen tekeminen pylvään vaippaan. Asennus on helppoa ja nopeaa. Keksintöä on myös helppo soveltaa sellaisiin pylväisiin, jotka eivät ole tasapaksuja, vaan kartiomaisia tasaisesti kaventuvina tai askelittain kaventuvina. Viimeksi mainittu malli on suhteellisen yleisesti käytetty erityisesti valaisinpylväissä. Tällöin pylväs on tehty liittämällä päittäin yhteen halkaisijaltaan pienenevia metalliputken paloja. Erityisesti tällaisessa tilanteessa on ulkokerros yhtenäinen kerros koko pylvään pituudella. Ulkokerros voidaan tehdä esimerkiksi sopivasta muovimateriaalista.

Kaiken kaikkiaan keksinnön mukaisen esivalmistellun pylvään uskotaan tuovan merkittäviä etuja nykyisin käytössä oleviin pylväisiin verrattuna. Keksinnön mukaisessa pylväässä on vielä edellisten etujen lisäksi se hyvä puoli, että johtimet ovat tarvittaessa erittäin hyvässä suojassa. Suojan pitävyyttä on mahdollista lisätä sopivilla materiaalivalinnoilla.

Patenttivaatimukset

1. Pylväs (1), joka on erityisesti ontto, putkimainen kappale ja tarkoitettu käytettäväksi etenkin kohteissa, joissa pylväässä on tarkoitus johtaa sähkövirtaa, signaaleja tai vastaavia, **tunnettu** siitä, että pylvääseen (1) kuuluu integraalisena osana ainakin yksi johdin (5) tai johdinkimppu virran, signaalin tai vastaavan johtamista varten tai yksi tai useampi vientiväline johdinta tai johdinkimppua varten.

2. Patenttivaatimuksen 1 mukainen pylväs, **tunnettu** siitä, että pylväässä (1) on monikerrosrakenne, jolloin johdin tai johdinkimppu (5) tai niiden vientiväline sijaitsee kerroksien välissä, niiden sisällä tai pinnalla.

3. Patenttivaatimuksen 2 mukainen pylväs, **tunnettu** siitä, että pylväässä (1) on kaksikerrosrakenne (3, 4).

4. Patenttivaatimuksen 1 mukainen pylväs, **tunnettu** siitä, että johdin tai johtimet (5) on liitetty yhteen tai useampaan liittimeen (6) ainakin pylvään alaosassa.

5. Jonkin edellisen patenttivaatimuksen mukainen pylväs, **tunnettu** siitä, että ainakin yksi kerroksista (3, 4) on muodostettu joustavasta materiaalista.

5. Patenttivaatimuksen 1 mukainen pylväs, **tunnettu** siitä, että johdin tai johdinkimppu (5) sijaitsee pylvään kahden rakennekerroksen (3, 4) välisellä rajapinnalla.

6. Patenttivaatimuksen 1 mukainen pylväs, **tunnettu** siitä, että johtimen tai johdinkimpun (5) vientiväline on putki.

PCT/FI98/00596

(57) Tiivistelmä

Keksintö koskee pylvästä (1), jossa on olennaisena osana johdin tai johdinsarja (5) virran, signaalin tai vastaavan kuljettamiseksi.

(Fig. 1)

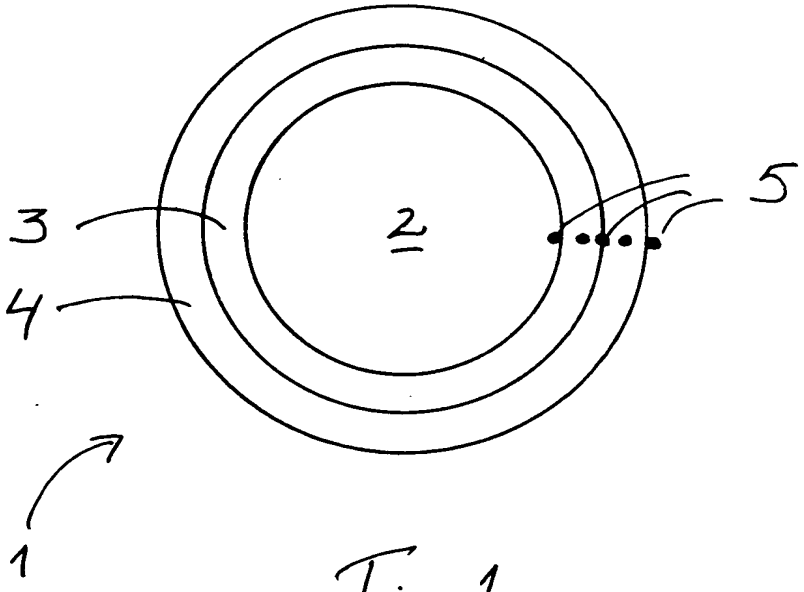

Fig. 1

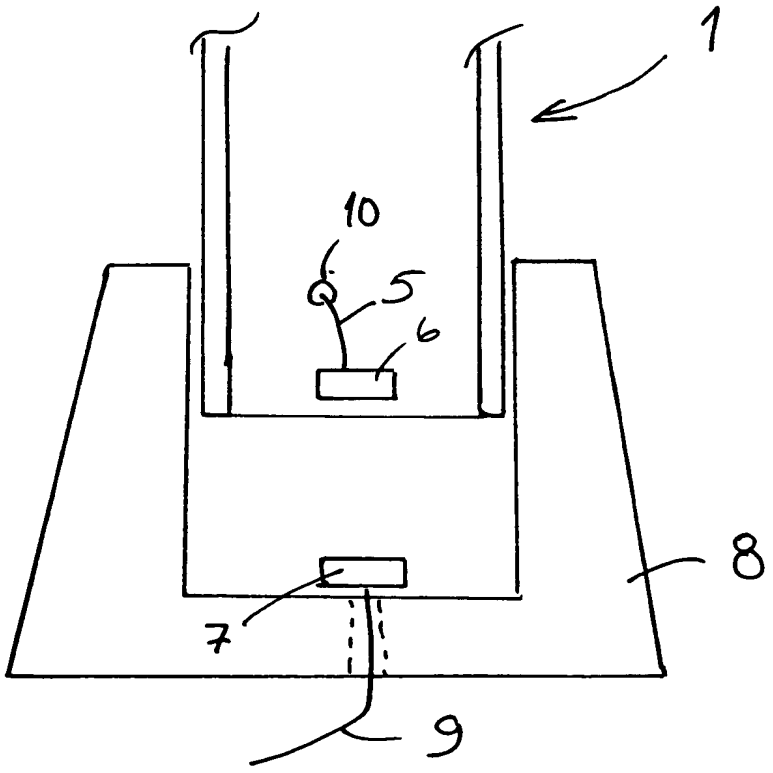

Fig 2

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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A1

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(71) Applicant *(for all designated States except US)*: JEROL OY AB [FI/FI]; Skutvägen 1, FIN–10600 Ekenäs (FI).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: JERNSTRÖM, Rolf [FI/FI]; Skutvägen 1, FIN–10600 Ekenäs (FI).

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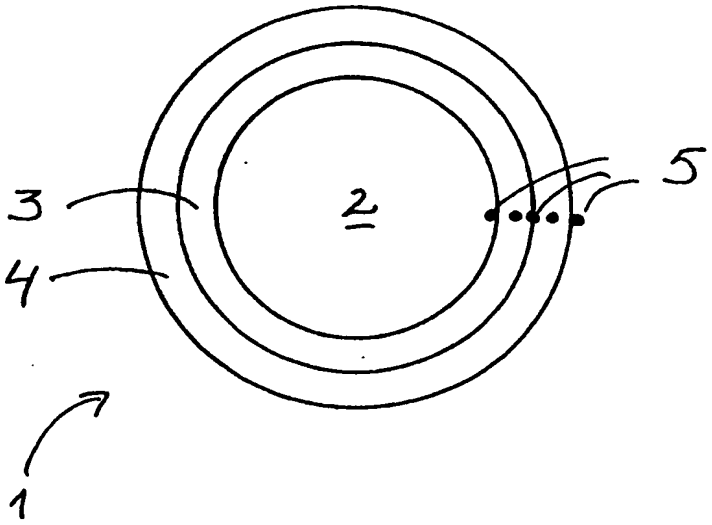
(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published

With international search report.
In English translation (filed in Finnish).

(54) Title: A POLE



(57) Abstract

The invention relates to a post (1), in which there is an integral lead or wiring harness (5), for conducting a current, signal or similar.

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A Pole

The present invention relates to a post, especially, but not exclusively, a post that can be used, for example, in traffic signs, streetlights, traffic lights and various signposts.

Posts for such purposes are manufactured from many different materials and are generally hollow for many reasons, such as saving material. Various kinds of metal post appear to be the most commonly used. Other alternatives include posts made from reinforced and other plastics. Wooden posts are also in general use.

Posts supporting different kinds of electically operated devices, such as traffic lights or lighting devices in general, or other devices to which data or even only current must be led, require the addition of suitable wiring to conduct signals or current. Conventionally, this is achieved by leading suitable wiring into the post from below, and connecting it to wiring inside the post by means of an access plate in the post. This plate is generally large and significantly reduces the durability of the post.

This invention is intended to create a post, in which some or all of the above detriments have been eliminated, achieving a prefabricated, highly adaptable type of post for very many different applications.

The above and other benefits and advantages of this invention are achieved in the manner described as characteristic in the accompanying Claims.

The invention is next described by reference to the accompanying drawings, which illustrate practical applications of the best embodiments of the invention.

Thus, Figure 1 shows a cross-section of one embodiment of a post according to the invention, and

Figure 2 shows one possible arrangement of the connection between a post according to the invention and external devices.

Thus, Figure 1 shows a non-scale diagram of the cross-section of a post 1 according to the invention. The post is specifically hollow, and so contains a longitudinal hollow core 2. The basic construction of the post is double, with an inner layer 3 and an outer layer 4. The thicknesses of these layers 3 and 4 may differ completely from to those shown in the figure. The most likely wall thicknesses are obviously less than those shown.

In this application, the invention is illustrated by a double-layered construction, which, however, is in no way essential. The situation would be absolutely identical, if there were only one layer, or if more layers were added to make three or more.

Figure 1 shows exaggerated enlargements of five places where the basic concept of the invention, i.e. a preinstalled lead or wiring harness 5, can be located according to the invention. It is highly probable that only one or two of the locations referred to above will be used, with, for example, one wiring harness located on one side of the post and the other on the other side, so that wiring 5 can be in the same, or a different position in relations to layers 3 and 4 of the post.

Therefore, wiring can be located on the inner surface of the tube-like post, within the inner layer 3, on the interface of layers 3 and 4, in the outer layer 4, or on the surface of the outer layer 4. In a single-layer construction, there are naturally only three locations, on the surfaces of, or within the layers. The location depends to a great extent on the material of the post. It is obvious, that, if a metal tube is used for the post, it will not be technically feasible, or at least sensible, to place the wiring within this kind of layer. However, if plastic materials are used, it will be easy to place the wiring inside a layer.

On the other hand, there are many cases, in which it is inappropriate to locate the wiring at the same point within the cross-section over the entire length of the post. Thus, in such cases, the wiring can move from one location to another. For example, the wiring may be placed between two layers in the upper part of the post, and move to the inner surface in the lower part. Depending on the situation, the transfer may be inwards or outwards, or even vary, as required. In one possible alternative, the wiring may form a spiral or other non-linear structure around the post.

It should be noted at this stage that a 'layer' is a very vague concept in this invention, and that, for example, a situation, in which wiring is pre-attached by a tape-like layer to the outer surface of the post, will fall within the invention's scope of protection. The above reference is intended to extend the scope of protection to very thin layers too.

As stated above, the construction of the post may, in practice, vary very greatly. One example of a construction may have a single plastic layer reinforced by a suitable laminating method and placed on top of a suitable inner layer 3, so that the wiring harness, suitably protected by the outer layer, lies in the interface of the two layers. The inner layer can be made from almost any material, for example, celluar plastic, as it is mainly intended as a base for the formation of the outer layer. Naturally, the inner layer may even be a metal tube. Any reinforcement known to the art, such as glass or other fibres, fabric, netting or similar can be added to the layers to reinforce them. As stated above, there may be several layers, when their materials and manners of manufcture may vary according to the prevailing requirements.

Figure 2 shows diagrammatically how a post according to the invention can be prefabricated, so that connector 6, to which the leads 5 are attached is placed in the lower section of post 1. On the other hand, there may be several connectors, connecting to different wiring harnesses, when the connector corresponding to the current requirements is guided into connector 7 in base 8, which may be of any type and shape whatever, to which leads 9 are led from outside. If there are several connectors 6 within the post, a suitable connector is guided to connector 7 by turning the post, so that the connectors it is intended to join are opposite one another, and then pushing the post into the base. A rotating movement can also be used, for example, to bring the connectors into proper contact with each other. As such, the connectors may be of any known type at all. In Figure 2, the leads are shown as being brought into the inner core of the post through a hole 10 in the wall of the post, for example, from the space between layers 3 and 4.

Instead of wiring being installed directly in the post to take a signal or similar from one point to another, the basic idea of the invention also includes the alternative that, in place of the wiring, an instrument or instruments can be located in the post, by

means of which a lead can be easily and quickly set in place. In practice, such a feed-through device is usually a tube, inside which the wiring can be pushed. Though a plastic tube with a circular cross-section is usually the cheapest and most suitable alternative, it is obvious that the shape of the tube or similar is of no significance. What is important, however, is that the device forms a suitable, easily used channel for the incoming wiring.

The arrangement described above avoids the need to make hatches in the cover of the post. Installation is easy and quick. The invention can also be easily adapted to posts that are not of a single diameter, but which taper conically evenly or narrow in steps. The latter model is in quite general use, particularly in lampposts. In this case, the post is made by joining together sections of metal piping with decreasing diameters. Particularly in this situation, the outer layer is unified throughout the entire length of the post. The outer layer can be made, for example, from a suitable plastic material.

All in all, it is believed that a prefabricated post according to the invention brings significant advantages compared to the posts that are in use at present. In a post according to the invention has the additional advantage that, if necessary, the wiring is extremely well protected. The permanence of the protection can be increased by selecting a suitable material.

Claims

1. A post (1), which is especially a hollow, tube-like piece and which is intended to be used particularly in places, in which it is intended to lead an electrical current, signal or similar to it, **characterized** in that the post (1) includes, as an integral part, at least one lead (5) or wiring harness for conducting the current, signal or similar, or one or more feedthrough devices for a lead or wiring harness.

2. A post according to Claim 1, **characterized** in that the post (1) has a multi-layered construction, when the lead or wiring harness (5) or their feedthrough device is located between or within the layers or on their surface.

3. A post according to Claim 2, **characterized** in that the post (1) has a double-layered construction (3, 4).

4. A post according to Claim 1, **characterized** in that the lead or wiring harness (5) are connected to one of more connectors (6), at least in the lower section of the post.

5. A post according to one of the above Claims, **characterized** in that at least one of the layers (3, 4) is formed from a flexible material.

6. A post according to Claim 1, **characterized** in that the lead or wiring harness (5) is located in the interface between two of the structural layers (3, 4) of the post.

7. A post according to Claim 1 **characterized** in that the feedthrough device for the lead or wiring harness (5) is a pipe.

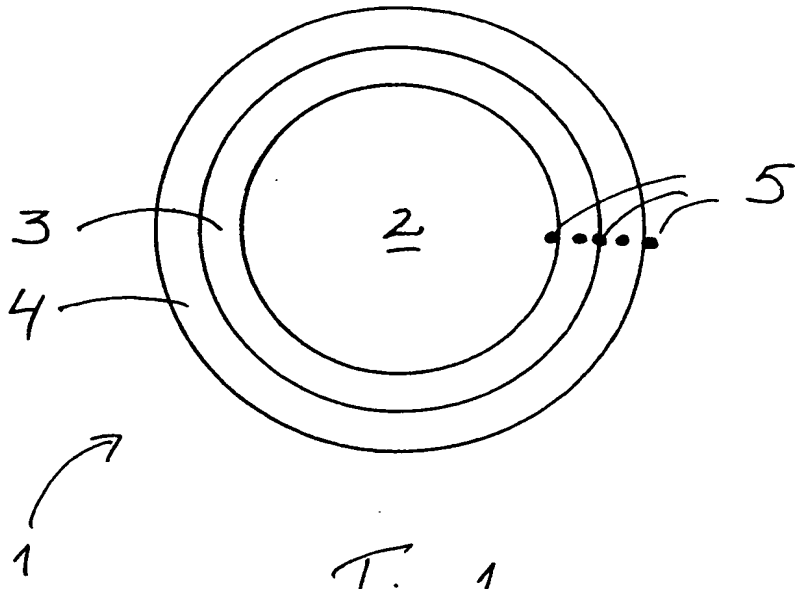

Fig. 1

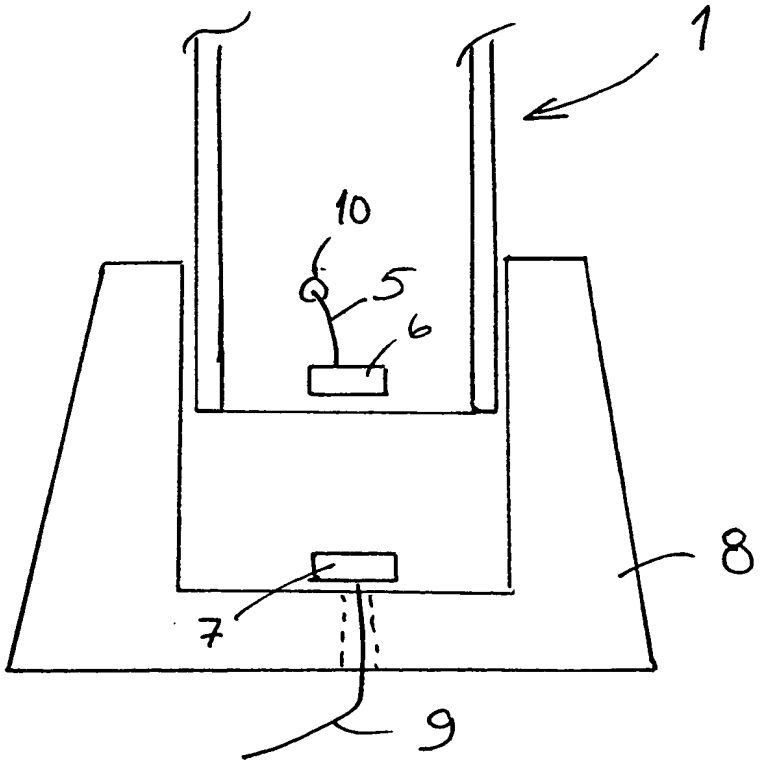

Fig 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI 98/00696

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: E04H 12/22, H02G 7/20
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: E04H, H02G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5600537 A (M.K. GORDIN ET AL), 4 February 1997 (04.02.97), column 26, line 10 - line 48, figures 27,32,41	1,4,7
X	WO 8501977 A1 (GEBELIUS, S.R.V.), 9 May 1985 (09.05.85), page 3, line 1 - line 37, figures 1-4	1,4
X	US 5335160 A (P.F. SAVOCA), 2 August 1994 (02.08.94), column 4, line 53 - column 5, line 21, figures 2-4	1,4,7

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
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Date of the actual completion of the international search	Date of mailing of the international search report
20 November 1998	24 -11- 1998
Name and mailing address of the ISA: Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Ingemar Hedlund Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI 98/00696

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9726663 A1 (BASIC RESOURCES, INC.), 24 July 1997 (24.07.97), page 12, last paragraph - page 15, first paragraph, figures 5A,5B --	1,7
X	GB 943107 A (B. WHITEHEAD), 27 November 1963 (27.11.63), page 2, line 35 - line 57, figure 2 --	1,4,7
A	US 5586742 A (E.R. CARTER), 24 December 1996 (24.12.96), column 5, line 20 - line 49, figure 7A -- --------	1-7

INTERNATIONAL SEARCH REPORT

Information on patent family members

03/11/98

International application No.
PCT/FI 98/00696

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5600537 A	04/02/97	CA 2058261 A	07/08/92
WO 8501977 A1	09/05/85	CA 1230727 A	29/12/87
		EP 0189395 A,B	06/08/86
		IN 161288 A	07/11/87
		SE 8300376 D	00/00/00
		US 4617768 A	21/10/86
US 5335160 A	02/08/94	CA 2127662 A	14/01/95
WO 9726663 A1	24/07/97	AU 1751497 A	11/08/97
		US 5726507 A	10/03/98
GB 943107 A	27/11/63	NONE	
US 5586742 A	24/12/96	US 5608994 A	11/03/97

17

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference –	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/FI98/00696	International filing date *(day/month/year)* 08.09.1998	Priority date *(day/month/year)* 08.09.1997
International Patent Classification (IPC) or national classification and IPC7 E04H 12/22, H02G 7/20		
Applicant Jerol Oy Ab et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
07.04.1999	25.11.1999
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88 Telex 17978 PATOREG-S	Authorized officer Ingemar Hedlund / MR Telephone No. 08-782 25 00

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/FI98/00696

I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

☐ the international application as originally filed.

☒ the description, pages 1-4, as originally filed,
pages _____, filed with the demand,
pages _____, filed with the letter of _____,
~~pages~~ _____, filed with the letter of _____.

☒ the claims, Nos. _____, as originally filed,
Nos. _____, as amended under Article 19,
Nos. _____, filed with the demand,
Nos. 1-6, filed with the letter of 02.09.1999,
Nos. _____, filed with the letter of _____.

☒ the drawings, ~~sheets~~/fig 1-2, as originally filed,
~~sheets~~/fig _____, filed with the demand
~~sheets~~/fig _____, filed with the letter of _____,
~~sheets~~/fig _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, ~~sheets~~/fig _____

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

V. Resoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-6	YES
	Claims		NO
Inventive step (IS)	Claims	1-6	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-6	YES
	Claims		NO

2. Citations and explanations

Amendments to the claims were submitted on 2 September 1999.

The claimed invention relates to a hollow, tube-like post, inside which an electrical current, signal or similar is intended to be lead. The post includes, as an integral part, at least one lead or wiring harness for conducting the current, signal or similar, or one or more feed through devices for a lead or wiring harness. The post has a construction of at least two layers and the wires or the feed through devices are located between or within the layers or on their surface.

US 5600537 A shows a hollow, tube-like post, inside which an electrical current is lead. The post includes a lead or wiring harness for conducting the current. The lead or wiring harness is connected to a connector in the lower section of the post and the feed through device for the lead or wiring harness is a pipe.

WO 8501977 A1 shows a hollow, tube-like post, inside which an electrical current is lead. The post includes a lead or wiring harness for conducting the current. The lead or wiring harness is connected to a connector in the lower section of the post.

US 5335160 A shows a hollow, tube-like post, inside which an electrical current is lead. The post includes a lead or wiring harness for conducting the current. The lead or wiring harness is connected to a connector in the lower section of the post and the feed through device for the lead or wiring harness is a pipe.

.../...

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V.

WO 9726663 A1 shows a hollow, tube-like post, inside which an electrical current is lead. The post includes a lead or wiring harness for conducting the current. The feed through device for the lead or wiring harness is a pipe.

GB 943107 A shows a hollow, tube-like post, inside which an electrical current is lead. The post includes a lead or wiring harness for conducting the current. The lead or wiring harness is connected to a connector in the lower section of the post and the feed through device for the lead or wiring harness is a pipe.

The invention according to the claims mainly differs from each of US 5600537 A; WO 8501977 A1; US 5335160 A; WO 9726663 A1 and GB 943107 A in that the post has a construction of at least two layers, the lead or wiring harness is an integral part of the post and in that the wires or the feed through devices are located between or within the layers or on their surface.

None of the documents cited in the International Search Report, or any relevant combination of them, reveals a hollow, tube-like post inside which an electrical current, signal or similar is intended to be lead according to the invention.

Claims 1 - 6 are, therefore, considered to meet the criteria of novelty, inventive step and industrial applicability.